

SATELLITE METHODS AND STRUCTURES FOR IMPROVED  
ANTENNA POINTING AND WIDE FIELD-OF-VIEW  
ATTITUDE ACQUISITION

ABSTRACT OF THE DISCLOSURE

Methods and structures are provided for reducing pointing errors  $\zeta$  of satellite antennas and for generating broad field-of-view satellite attitude acquisition patterns. In one method embodiment, satellite transmit beams have estimated pointing attitudes  $\beta$  and are transmitted to overlap on a ground-based receiving terminal which has a known terminal location  $\lambda$  and which measures received signal strengths  $\alpha$ . Pointing errors  $\zeta$  of the transmit beams are then determined from the estimated pointing attitudes  $\beta$ , the terminal location  $\lambda$  and the signal strengths  $\alpha$  and the pointing errors  $\zeta$  are subsequently reduced by revising the pointing attitudes  $\beta$ . Other method embodiments utilize known signal-strength functions and antenna signals with known signal parameters such as frequencies and/or modulations.